

**REMARKS**

Claims 1 and 2 have been amended, and claims 3 and 4 have been deleted. Upon entry of this amendment, the pending claims will be claims 1, 2 and 5-16, with claims 5-16 being withdrawn from consideration.

Support for the amendments to claims 1 and 2 may be found in Table 2 on page 19 of the present specification. This Table 2 shows that linking group, A, in repeating units may be selected from a single substituent.

For the reasons given on page 2 of the Official Action, claims 1-4 are rejected under 35 USC 103(a) over the disclosure of any one of five (5) Chemical Abstracts, i.e. CA 133:76729 or CA 132:253582 or CA 132:253569 or CA 132:239425 or CA 131:325079.

This rejection is respectfully traversed.

Neither these Chemical Abstracts nor the original publications pertaining thereto would appear to suggest the embodiments of the present claims 1 and 2, where the linking group, A, is a single substituent selected from the substituents recited in these claims.

Before addressing the particular disclosures of the various Chemical Abstracts, the undersigned offers some comments regarding the manner in which these Chemical Abstracts were applied in the Official Action.

The undersigned notes that copies of the actual Chemical Abstracts, per se, were not provided with the Official Action. The pages provided with the Official Action would appear to be pages of a printout from a computer search. These pages would appear to include recitations of

the abstracts next to the abbreviations "AB". However, these pages would also appear to include much other information, such as chemical formulae, not recited in the Chemical Abstracts.

The report provided with the Official Action includes pages identified as page numbers 62-64 and 73-80. These page numbers are shown on the top of each page next to the name of the Examiner, the serial number of the present application and a date (i.e. "TROUNG 09/934537 2/13/04").

As indicated on pages 73-5, Chemical Abstract 132:253582 was apparently identified as a "hit" for various search parameters, recited in bold on page 75. These search parameters would appear to include Registry No. "27389-27-4", Registry No. "31694-16-3", "gaskets" and "batteries". A copy of this page 75 is attached hereto.

As suggested on line 7 of page 75, Registry No. 27380-27-4 apparently has some relation to a composition identified as "Pek", and Registry No. 31694-16-3 apparently has some relationship to a composition identified as "Peek".

As indicated on lines 11-13 of page 75, Registry No. 27380-27-4 apparently is a compound identified on line 12 as "poly(oxy-1,4-phenylenecarbonyl-1,4-phenylene)", and having the formula identified on line 13.

As indicated on lines 14-17 of page 75, Registry No. 31694-16-3 apparently is a compound identified on line 16 as "poly(oxy-1,4-phenyleneoxy-1,4-phenylenecarbonyl-1,4-phenylene)", and having the formula identified on line 17.

It is clear, however, that Chemical Abstract 132:253582 does not mention either

“poly(oxy-1,4-phenylenecarbonyl-1,4-phenylene)” or  
“poly(oxy-1,4-phenyleneoxy-1,4-phenylenecarbonyl-1,4-phenylene)”. Furthermore, Chemical Abstract 132:253582 does not mention either a composition identified as “Pek” or a composition identified as “Peek”.

Accordingly, the report provided with the Official Action does not properly reflect the contents of the Chemical Abstracts applied against the claims in the Official Action. In an effort to clarify this matter, the undersigned telephoned Examiner Truong on the morning of March 11, 2004, and explained that the report was different from the cited Chemical Abstracts. The undersigned requested copies of the true Chemical Abstracts. Examiner Thuong said that the true Chemical Abstracts may have been omitted as a result of a clerical error. Examiner Thoung further said that he would fax copies of the true Chemical Abstracts on the afternoon of March 11, 2004. However, the material faxed to the undersigned was a duplicate copy of the report already provided with the Official Action, not copies of the true Chemical Abstracts. Perhaps the first clerical error was repeated a second time.

In an attempt to further clarify this matter, the undersigned also ordered copies of the true Chemical Abstracts from NERAC. A copy of the NERAC report is enclosed herewith. It is clear from the NERAC report that the true Chemical Abstract 132:253582 does not mention “poly(oxy-1,4-phenylenecarbonyl-1,4-phenylene)” or  
“poly(oxy-1,4-phenyleneoxy-1,4-phenylenecarbonyl-1,4-phenylene)” or “Pek” or “Peek”.

Under the circumstances, the rejection over the Chemical Abstracts is traversed on

technical grounds. True copies of the Chemical Abstracts were not provided with the Official Action. Furthermore, the report provided with the Official Action was apparently dated, "2/13/04", and, therefore, does not constitute prior art to the present application, filed August 23, 2001.

On page 2 of the Official Action, it is stated:

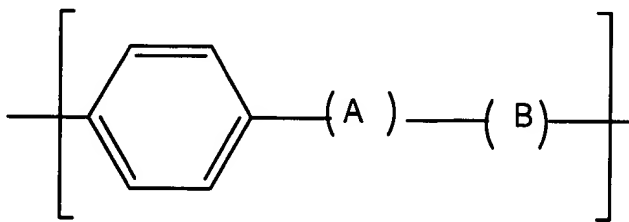
133:76729 discloses secondary nonaqueous electrolyte batteries comprising the repeating units, wherein p-phenylene is combined with carbonyl group.

However, CA 133:76729 does not disclose repeating units, wherein p-phenylene is combined with carbonyl group.

As indicated on page 64 of the pages provided with the Official Action, CA 133:76729 merely recites:

The batteries are sealed with gaskets, etc., and use Li +- intercalatable cathodes, anodes, Li+- conductive nonaq. electrolytes, and separators comprising porous film-shaped or nonwoven fabric sheets mixed or coated with polymers capable of swelling by absorbing electrolyte solns. or solid polymer electrolytes. The porous sheets and the gaskets may be made of heat-resistant polymers. Diagrams of coin-type batteries are given. The batteries show high capacity and are resistant to high temperature during reflow soldering.

From the rejection, it would appear that CA 133:76729 is interpreted to suggest polymers with repeating units of the formula



where A is a group recited in claim 1, [i.e. "C(O)"] and B is a group not recited in claim 1 i.e. "O-CH<sub>2</sub>-CH<sub>2</sub>-O"].

In the foregoing amendments, claim 1 is amended to recite a polymeric material composed of a single type of repeating unit. This wording would exclude the presence of the group, "O-CH<sub>2</sub>-CH<sub>2</sub>-O".

On page 2 of the Official Action, it is stated:

132:253582 discloses a battery polymeric materials comprising repeating units, wherein p-phenylene is combined with oxygen and carbonyl groups.

However, CA 132:253582 does not disclose battery polymeric materials comprising repeating units, wherein p-phenylene is combined with oxygen and carbonyl groups.

As indicated on page 74 of the pages provided with the Official Action, CA 132:253582 merely recites:

The batteries have metal oxide, halide, or sulfide based cathodes, anodes of light metals or their alloys, separators composed of materials having heat resistance  $\geq 150^\circ$  between electrodes, electrolyte solns. containing Li salts dissolved in a single or a mixed organic solvent, b.  $\geq 170^\circ$ , an anode terminal sealed by a solvent resistant insulator gasket having heat resistance  $\geq 150^\circ$  to the battery case, and mounting cathode and anode terminals connected to the battery terminals. The batteries are mounted on substrates for use under centrifugal force, by controlling the thickness direction of the battery to form a 0-60° angle with the direction of the centrifugal force, with the half part of the battery in the thickness direction having lower void volume placed at the front side of the centrifugal force direction. The mounting device includes cathode and anode mounting terminals of different shape to distinguish the front and back sides for mounting.

As indicated on lines 1-3 near the top of page 74 of the pages provided with the Official Action, the CA 132:253582 is apparently an abstract of disclosure provided in "JP 2000106195",

as well as in "US 6376109", i.e. the Sano et al U.S. Patent No. 6,376,109. A copy of this Sano patent is enclosed herewith.

The Sano patent does not disclose polymeric materials comprising repeating units, wherein p-phenylene is combined with oxygen and carbonyl groups. In Table 2 on columns 9 and 10 of the Sano patent, reference is made to a PEK resin and a PEEK resin. These resins are identified in the passage at column 9, lines 25-30, wherein it is stated:

In Table 2, moreover, polyphenylene sulfide resin is noted as PPS, polyether ketone resin as PEK, polyether ether ketone resin as PEEK, polypropylene resin as PP, gamma butylactone resin as GBL, dimethoxy ethane as DME, epoxy resin as EP, polyurethane resin as PU, and polyethylene terephthalate as PET.

Literally, a polyether ketone resin (PEK) and a polyether ether ketone resin (PEEK) need not contain any p-phenylene groups. A host of other hydrocarbylene groups, such as alkylene groups, which are not p-phenylene groups, could be present.

Accordingly, even the full disclosure pertaining to CA 132:253582 does not describe the polymer identified as "poly(oxy-1,4-phenylenecarbonyl-1,4-phenylene)", or the polymer identified as "poly(oxy-1,4-phenyleneoxy-1,4-phenylenecarbonyl-1,4-phenylene)", as recited on page 75 of the pages provided with the Official Action.

It is certainly unclear from the present record, at the time of the Official Action, whether one skilled in the art would necessarily associate "PEK" with "poly(oxy-1,4-phenylenecarbonyl-1,4-phenylene)" or "PEEK" with "poly(oxy-1,4-phenyleneoxy-1,4-phenylenecarbonyl-1,4-phenylene)". However, in an effort to

supplement the record on this issue, enclosed herewith is a copy of a page from the Polymer Handbook and a copy of the Daniels et al U.S. Patent No. 5,003,032.

The page from the Polymer Handbook would appear to associate PEEK with poly(oxy-1,4-phenylene-oxy-1,4-phenylene-carbonyl-1,4-phenylene).

The following is stated at column 1, lines 22-41, of the Daniels et al U.S. Patent No. 5,003,032:

Polyaryletherketones are particularly useful since they are usually crystalline, have relative high glass transition (Tg's) and melting temperatures (Tm's) and exhibit a variety of useful properties such as excellent electrical insulating and mechanical properties at high temperatures and high strength, toughness and resistance to fire and chemicals. Two particular polymers, i.e. polyetherketone (PEK), Tg=156° C., Tm=365° C., having the repeating unit:

--Ph--O--Ph--CO--

wherein Ph is 1,4-phenylene and polyetheretherketone (PEEK). Tg=144° C. Tm=334° C. having the repeat unit:

--O--Ph--O--Ph--CO--Ph--

have been commercially exploited.

For the record, applicants expressly deny that they admit that one skilled in the art would associate the term "PEK" with "poly(oxy-1,4-phenylenecarbonyl-1,4-phenylene)" or "PEEK" with "poly(oxy-1,4-phenyleneoxy-1,4-phenylenecarbonyl-1,4-phenylene)". However, in order to obviate this issue, claims 1 and 2 have been amended to exclude "poly(oxy-1,4-phenylenecarbonyl-1,4-phenylene)" and "poly(oxy-1,4-phenyleneoxy-1,4-phenylenecarbonyl-1,4-phenylene)".

On page 2 of the Official Action, it is stated:

132:253569 discloses secondary nonaqueous electrolyte batteries comprising repeating units, wherein p-phenylene is combined with oxygen or carbonyl group and a COO group.

However, CA 132:253569 does not recite materials comprising repeating units, wherein p-phenylene is combined with oxygen or carbonyl group and a COO group.

As indicated on pages 75 and 76 of the pages provided with the Official Action, CA 132:253569 merely recites:

The batteries have separators containing a heat resistant porous film and a shutdown film between the battery electrolyte, with the porous film facing the cathode.

CA 132:253569 does not disclose the polymer identified as “poly(oxy-1,4-phenyleneoxycarbonyl-1,4-phenylenecarbonyl)”, as identified on page 76 of the pages provided with the Official Action.

Even assuming, arguendo, that the full disclosure of the document pertaining to CA 132:253569 does disclose the polymer identified as poly(oxy-1,4-phenyleneoxycarbonyl-1,4-phenylenecarbonyl), such a compound does not suggest a compound recited in the present claims.

In the present claim 1, the list of A groups does not include carbonyloxy.

Regarding the rejection over the disclosure of CA 132:239425 and CA 131:325079, it would appear that poly-p-phenylene terephthalic amide is disclosed in the full disclosure (JP 2000100409) pertaining to CA 132:239425. Enclosed herewith is a more complete abstract of JP



2000100409.

Accordingly, to obviate the rejection over CA 132:239425 and CA 131:325079, the amide group from the list of groups recited in claim 1, as per the foregoing amendments.

In view of the foregoing remarks, it is clear that the reliance on Chemical Abstracts, as cited in excerpts of a search report, has created considerable difficulties for the applicant, as well as confusion on the record. It would have been better if original documents, such as the Sano et al U.S. Patent No. 6,376,109, were cited and provided, rather than Chemical Abstracts and excerpts of a report citing these abstracts.

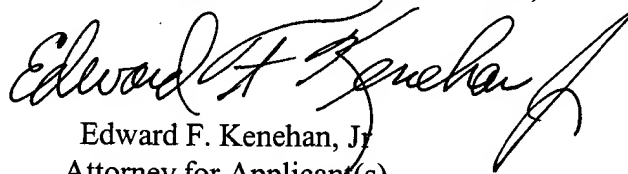
In view of the foregoing amendments and remarks, the rejection under 35 USC 103 should be withdrawn.

Allowance is requested.

In the event that this paper is not timely filed, Applicant respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



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Attachments: 1) page 75 of report provided with Office Action of February 27, 2004  
2) NERAC Report  
3) Patent Abstracts of Japan 2000-100409  
4) PTO/SB/08A (2 pages) and references cited thereof

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☐ 11 March 2004 at 17:52 - ANSWER 1 OF 5ZCAPLUS ©2004 ACS on STN  
2000:474451-[Full Text](#)**Secondary nonaqueous electrolyte batteries using improved separators**

Patent Number JP 2000195494 A2 14 July, 2000

Jpn. Kokai Tokkyo Koho, 11 pp.

**Abstract**

The batteries are sealed with gaskets, etc., and use Li+-intercalatable cathodes, anodes, Li+-conductive nonaq. electrolytes, and separators comprising porous film-shaped or nonwoven fabric sheets mixed or coated with polymers capable of swelling by absorbing electrolyte solns. or solid polymer electrolytes. The porous sheets and the gaskets may be made of heat-resistant polymers. Diagrams of coin-type batteries are given. The batteries show high capacity and are resistant to high temperature during reflow soldering.

**Inventor(s)**

Watanabe, Shunji; Tamachi, Tsuneaki; Harada, Toyoo; Sakai, Tsugio; Iwasaki, Fumiharu

**Assignee(s)**

Seiko Instruments, Inc., Japan

**Application Information**

JP 1999-250370 3 September, 1999

**Priority Information**

JP 1998-300212 A 21 October, 1998

**Patent Information**

Number	Kind	Date	Application	Date
JP 2000195494	A2	14 July, 2000	JP 1999-250370	3 September, 1999

☐ 11 March 2004 at 17:52 - ANSWER 2 OF 5ZCAPLUS ©2004 ACS on STN  
2000:232760-[Full Text](#)**Batteries for mounting on substrates and method and apparatus for the mounting**

Patent Number JP 2000106195 A2 11 April, 2000

Jpn. Kokai Tokkyo Koho, 13 pp.

### ***Abstract***

The batteries have metal oxide, halide, or sulfide based cathodes, anodes of light metals or their alloys, separators composed of materials having heat resistance  $\geq 150^\circ$  between electrodes, electrolyte solns. containing Li salts dissolved in a single or a mixed organic solvent, b.  $\geq 170^\circ$ , an anode terminal sealed by a solvent resistant insulator gasket having heat resistance  $\geq 150^\circ$  to the battery case, and mounting cathode and anode terminals connected to the battery terminals. The batteries are mounted on substrates for use under centrifugal force, by controlling the thickness direction of the battery to form a  $0-60^\circ$  angle with the direction of the centrifugal force, with the half part of the battery in the thickness direction having lower void volume placed at the front side of the centrifugal force direction. The mounting device includes cathode and anode mounting terminals of different shape to distinguish the front and back sides for mounting.

### ***Inventor(s)***

Obi, Fumio

### ***Assignee(s)***

Matsushita Electric Industrial Co., Ltd., Japan

### ***Application Information***

JP 1998-312903 4 November, 1998

### ***Priority Information***

JP 1998-217246 A 31 July, 1998  
JP 1997-353297 A 22 December, 1997  
JP 1998-159077 A 8 June, 1998  
JP 1998-312903 A 4 November, 1998  
US 1998-212964 A3 16 December, 1998

### ***Patent Information***

Number	Kind	Date	Application	Date
JP 2000106195	A2	11 April, 2000	JP 1998-312903	4 November, 1998
US 6376109	B1	23 April, 2002	US 1998-212964	16 December, 1998
US 2002086191	A1	4 July, 2002	US 2001-41869	25 October, 2001
US 2002090537	A1	11 July, 2002	US 2001-41870	25 October, 2001

☐ 11 March 2004 at 17:52 - ANSWER 3 OF 5

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2000:227177-[Full Text](#)

## **Secondary nonaqueous electrolyte batteries**

Patent Number JP 2000100408 A2 7 April, 2000

Jpn. Kokai Tokkyo Koho, 7 pp.

### ***Abstract***

The batteries have separators containing a heat resistant porous film and a shutdown film between the battery electrolyte, with the porous film facing the cathode.

***Inventor(s)***

Takahashi, Tsutomu; Tateno, Tatsuo; Shinohara, Yasuo

***Assignee(s)***

Sumitomo Chemical Co., Ltd., Japan

***Application Information***

JP 1998-266262 21 September, 1998

***Priority Information***

JP 1998-266262 21 September, 1998

***Patent Information***

Number	Kind	Date	Application	Date
JP 2000100408	A2	7 April, 2000	JP 1998-266262	21 September, 1998

☐ 11 March 2004 at 17:52 - ANSWER 4 OF 5

ZCAPLUS ©2004 ACS on STN  
2000:223846-[Full Text](#)

**Alkaline battery separators**

Patent Number JP 2000100409 A2 7 April, 2000

Jpn. Kokai Tokkyo Koho, 6 pp.

***Abstract***

The separators are fiber sheets containing p-arom polyamide fibers having tensile strength  $\geq 20$  g/d.

***Inventor(s)***

Tanaka, Masanao; Sato, Kazuya

***Assignee(s)***

Japan Vilene Co., Ltd., Japan

***Application Information***

JP 1998-268865 24 September, 1998

***Priority Information***

JP 1998-268865 24 September, 1998

***Patent Information***

Number	Kind	Date	Application	Date
JP 2000100409	A2	7 April, 2000	JP 1998-268865	24 September, 1998

☐ 11 March 2004 at 17:52 - ANSWER 5 OF 5

ZCAPLUS ©2004 ACS on STN  
1999:739942-[Full Text](#)

## Separator for batteries with nonaqueous electrolyte

Patent Number DE 19918856 A1 11 November, 1999

Ger. Offen., 20 pp.

### *Abstract*

Separator for Li secondary batteries with nonaq. electrolyte comprise a heat-resistant N-containing aromatic polymer and a ceramic powder. The separator also contains a substrate of fabric, fleece, paper, or a porous film. The polymer used is an aromatic polyimide which is soluble in a solvent, and the ceramic powder is metal oxide, metal nitride, or metal carbide. The metal oxide is Al oxide, Si oxide, Ti oxide, or Zr oxide.

### *Inventor(s)*

Shinohara, Yasuo; Tsujimoto, Yoshifumi; Nakano, Tsuyoshi

### *Assignee(s)*

Sumitomo Chemical Co., Ltd., Japan

### *Application Information*

DE 1999-19918856 26 April, 1999

### *Priority Information*

JP 1998-116838 A 27 April, 1998

### *Patent Information*

Number	Kind	Date	Application	Date
DE 19918856	A1	11 November, 1999	DE 1999-19918856	26 April, 1999
TW 460505	B	21 October, 2001	TW 1999-88106201	19 April, 1999
CA 2269892	AA	27 October, 1999	CA 1999-2269892	26 April, 1999
JP 2000030686	A2	28 January, 2000	JP 1999-118004	26 April, 1999
JP 3175730	B2	11 June, 2001		
US 6447958	B1	10 September, 2002	US 1999-299077	26 April, 1999

RUONG 09/934537 2/13/04 Page 75

centrifugal force conditions)

IT 9003-07-0, Polypropylene 27380-27-4, Pek 31694-16-3, Peek

RL: DEV (Device component use); USES (Uses)

(gaskets for graphite fluoride/lithium batteries for use in high centrifugal force conditions)

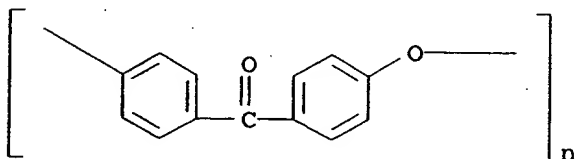
IT 27380-27-4, Pek 31694-16-3, Peek

RL: DEV (Device component use); USES (Uses)

(gaskets for graphite fluoride/lithium batteries for use in high centrifugal force conditions)

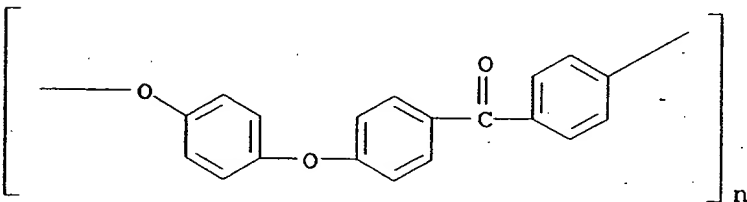
RN 27380-27-4 HCAPLUS

CN Poly(oxy-1,4-phenylenecarbonyl-1,4-phenylene) (9CI) (CA INDEX NAME)



RN 31694-16-3 HCAPLUS

CN Poly(oxy-1,4-phenyleneoxy-1,4-phenylenecarbonyl-1,4-phenylene) (9CI) (CA INDEX NAME)



L20 ANSWER 33 OF 55 HCAPLUS COPYRIGHT 2004 ACS on STN

AN 2000:227177 HCAPLUS

DN 132:253569

ED Entered STN: 07 Apr 2000

TI Secondary nonaqueous electrolyte batteries

IN Takahashi, Tsutomu; Tatenos, Tatsuo; Shinohara, Yasuo

PA Sumitomo Chemical Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M002-16

ICS H01M002-16; H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000100408	A2	20000407	JP 1998-266262	19980921
PRAI	JP 1998-266262		19980921		

AB The batteries have separators containing a heat resistant porous film and a shutdown film between the battery electrolyte, with the